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Department of Energy

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JUN 13 1997
DOE-1069-97

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V ; SRF-5J
77 W. Jackson Blvd.
Chicago, Illinois, 60604-3590

Mr. Thomas Schneider, Project Manager
***Ohio Environmental* Protection Agency**
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE SITE PREPARATION PLAN FOR AREA 2, PHASE I - INACTIVE FLYASH PILE, SOUTH FIELD AND ACTIVE FLYASH PILE (SOUTHERN WASTE UNITS)

The purpose of this letter is to transmit, for your review and approval, the following:

- **A revised Site Preparation Plan for Area 2, Phase I (Revision B)**
- **Riser Pipe detail**
- **Cross-sections and plan sheet with locations**

This document was revised in response to the meeting with the U. S. Environmental Projection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) on May 27, 1997. The revisions are currently being incorporated into the construction drawings, technical specifications and other project documents. Certified for Construction (CFC) drawings and technical specifications and a final Surface Water Management Plan (SWMP) will be forwarded to you on June 16, 1997. As previously discussed, the Fernald Environmental Management Project (FEMP) is now preparing Project Specific Plans for potential Final Remediation Level (FRL) Certification of non-impacted soils within the Southern Waste Units and Waste Acceptance Criteria (WAC) attainment in accordance with the approaches presented in the enclosed Site Preparation Plan.

As described in the Site Preparation Plan, the Department of Energy (DOE) is proceeding with activities to begin site preparation construction in the Southern Waste Units (SWUs) in

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the fall of 1997. Activities are progressing through procurement to select a subcontractor for these site preparation construction activities in the next few weeks. The procurement process needs to begin as soon as possible in order to initiate excavation/remediation activities in the SWUs in the summer of 1998. The planned schedule for the procurement process and mobilization of a site preparation subcontractor should allow sufficient time to address any additional regulatory concerns that EPA may have with the design of the site preparation plans before actual site preparation construction begins on or about September 2, 1997.

The draft Site Preparation Plan has been revised to address the following issues identified during the meeting with the U.S. EPA and OEPA:

- Basin liner system
- WAC attainment sampling and analysis
- FRL certification
- Basin dewatering
- Wood chip stockpile

The revisions address the following concepts and concerns:

- Basin Liner System. Many types of liner systems were identified and evaluated for the SWUs retention basins. The evaluation consisted of identifying the requirements of the liner, defining how the liner fits into the overall liner system, and then developing and evaluating a specific liner system to best meet the requirements. Based on this evaluation process, the liner system proposed for the basins will consist of (from top to bottom) the following layers:

    - 60 mil High Density Polyethylene (HDPE) geomembrane
    - Twelve inches of compacted clay
    - Existing sands and gravels of the Great Miami Aquifer (GMA)

    This combination (geomembrane and clay) liner system will meet the requirements of the project in an efficient and effective manner. Sediment will be removed by a slurry/suction process. Borrow material for the twelve inches of compacted clay will be obtained from the West Field Borrow Area (WFBA) west of the south access road. Extensive geotechnical testing has been performed on the material in the WFBA and it contains low plasticity or "CL" classified material with low permeability. The borrow area will be sampled and analyzed (according to the Project Specific Plan which will be provided to EPA for review prior to the initiation of sampling activities) to certify that it is below FRLs prior to placement in the basins. After remediation and certification of the SWUs are complete, the liner material from the basins (HDPE geomembrane, filter fabric and clay) will be removed and the area of the basins will be remediated and certified.

- WAC Attainment and FRL Certification. This section of the Site Preparation Plan has been modified to present the WAC attainment concepts discussed at the May 27, 1997, meeting. FRL certification for a borrow area has been inserted to address the use of borrow material to line the basins. FRL certification in the basins has been modified to add a screening step.

- Basin Dewatering. The riser pipes in all three basins were revised so that the basins will have the ability to completely dewater via gravity. The HDPE riser pipes in all three basins will be perforated to the bottom of the basins. The perforations will be one inch diameter holes. Aggregate with an approximate size of two inches will be piled against the riser to the sediment clean-out level. The aggregate will filter and slow the flow into the riser without excessive restrictions while providing the ability for the basins to dewater via gravity flow.

- Wood Chip Stockpile. As described in the Site Preparation Plan, runoff from wood chips will not adversely affect the water quality of Paddys Run. The stockpile will be managed in accordance with the existing National Pollutant Discharge Elimination System (NPDES) discharge permit for the FEMP.

- Cross-sections and Paddys Run Flood Stage. Three cross-sections were cut through the portion of the ditch where it is in closest proximity to both the inactive flyash pile (IFP) and Paddys Run, and three cross-sections were cut through Basin 1 and Paddys Run. These cross-sections and a plan view with their locations are attached.

  The IFP/Paddys Run cross-sections show that a ditch can be constructed in the area; the final location of the ditch will be determined in the field. Elevations of flood waters, resulting from 5, 25 and 100-year, 24-hour storm events, within Paddys Run in the proximity of the IFP area are as follows:

  - 5 - Year 24-hour storm- Elev. 543
  - 25 - Year 24-hour storm - Elev. 544
  - 100 - Year 24 hour storm - Elev. 545

  Basins were designed to pump the flow from the 10-year, 24 hour storm. The top elevation of the embankment for Basin 1 is Elevation 540. Therefore, when large rainfall events occur that exceed the 10-year 24-hour storm, Basin 1 is more likely to be over-topped with water coming into the basin than water flow going out.

  Elevation of the GMA groundwater levels are shown on the Basin 1 cross-sections. This information demonstrates that the groundwater levels are below the bottom of the basin.

We hope that this information addresses EPA concerns associated with the planned path forward on site preparation activities in the SWUs. If you should have any questions or comments on these proposals, please contact Robert Janke at (513) 648-3124.

Sincerely,

FEMP:RJJANKE

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosure: As Stated

cc w/enc:

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AREA 2, PHASE I SITE PREPARATION PLAN

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

JUNE 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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AREA 2, PHASE I SITE PREPARATION PLAN

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
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EXECUTIVE SUMMARY

This Area 2, Phase I Site Preparation Plan presents the general approach for performing site preparation activities at the Operable Unit 2 Southern Waste Units (SWUs). The SWUs include the Inactive Flyash Pile, South Field, and Active Flyash Pile. Remediation of the SWUs will be performed in separate site preparation and excavation phases. This plan addresses the site preparation phase which is scheduled to begin in the summer of 1997 and will consist of the tasks necessary to prepare the site for the subsequent excavation phase. Tasks that will be performed during site preparation include: establishing perimeter fencing and access controls, clearing trees and brush, constructing a surface water management system, establishing support facilities, constructing stockpiles, and other activities.

The surface water management system that will be constructed during site preparation will be operated during the remainder of site preparation and the subsequent excavation phase. The surface water management system will include ditches and retention basins that will control all run-off from the disturbed area of the SWUs and prevent a direct discharge to the environment at Paddys Run. Run-off from the SWUs area will be collected, controlled and managed in accordance with Operable Unit 5 (OU5) Record of Decision and National Pollutant Discharge Elimination System (NPDES) requirements.

During site preparation, no material will be removed from the vicinity of the SWUs. All excavated material will be temporarily stockpiled in the area or used in the construction of temporary facilities. Disposition of excavated material will be performed in the subsequent excavation phase in accordance with sampling and analysis plans for certification and waste acceptance criteria (WAC) attainment.

Site preparation construction activities must be completed before the excavation phase can begin. The excavation phase of SWUs remediation is scheduled to begin in 1998. The estimated site preparation construction period is five months. Therefore, to begin and perform excavation for the maximum construction period in 1998, site preparation activities must begin in the summer of 1997.

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LIST OF ACRONYMS

A2PI	Area 2, Phase I
AFP	Active Flyash Pile
ASCOC	area-specific contaminant of concern
AWWT	Advanced Wastewater Treatment (facility)
CU	certification unit
DOE	U.S. Department of Energy
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FRL	final remediation level
GMA	Great Miami Aquifer
gpm	gallons per minute
IFP	Inactive Flyash Pile
IRDP	Integrated Remedial Design Package
NPDES	National Pollutant Discharge Elimination System
ODNR	Ohio Department of Natural Resources
OSDF	On-Site Disposal Facility
OU	Operable Unit
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SF	South Field
SWMP	Surface Water Management Plan
SWRB	Stormwater Retention Basin
SWUs	Southern Waste Units
WAC	waste acceptance criteria

REFERENCES

Ohio Department of Transportation, 1992, Ohio Department of Transportation Construction and Material Specifications and the Location and Design Manual, Volume 2, "Drainage Design," Bureau of Location and Design, Columbus, Ohio.

U.S. Department of Energy, 1995, "Final Record of Decision for Remedial Actions at Operable Unit 2," Fernald Environmental Management Project, DOE, Fernald Area Field Office, Cincinnati, OH.

U.S. Department of Energy, 1996a, "Geotechnical Data and Evaluation Report for East and South Field Borrow Areas," Fernald Environmental Management Project, DOE, Fernald Area Field Office, Cincinnati, OH.

U.S. Department of Energy, 1996b, "Record of Decision for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Field Office, Cincinnati, OH.

U.S. Department of Energy, 1997, "Surface Water Management Plan," Rev. D, Fernald Environmental Management Project, DOE, Fernald Field Office, Cincinnati, OH.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this plan is to present the general approach for performing site preparation construction activities in Area 2, Phase I (A2PI), and to describe the integration between those construction activities and associated Waste Acceptance Criteria (WAC) attainment and Final Remediation Level (FRL) certification.

1.2 Background

Area 2, Phase I consists of the Operable Unit 2 (OU2) Southern Waste Units (SWUs). The SWUs are the Inactive Flyash Pile (IFP), South Field (SF), and Active Flyash Pile (AFP). The OU2 SWUs remediation project will be the first large soil remediation project at the FEMP. During remediation, approximately 340,000 cubic yards of impacted material will be excavated and removed from the SWUs and placed in the Fernald Environmental Management Project (FEMP) On-Site Disposal Facility (OSDF) or in an interim staging area prior to shipment to off-site commercial disposal facilities. Impacted material consists of material placed in the SWUs during U.S. Department of Energy (DOE) Operations at Fernald and material with contaminant concentrations above FRLs.

The general layout of the SWUs area and the major components of the site preparation work are shown in Figure 1.1, Area 2, Phase I Site Preparation Components.

1.3 Remediation Phasing

Remediation activities at the SWUs will include separate site preparation and excavation phases. Site preparation and excavation will be performed in a logical and sequential manner under separate subcontracts. Site preparation will consist of those tasks necessary to prepare the site for excavation. The excavation phase will consist of excavation, transportation and disposal of impacted material from, and subsequent restoration of the SWUs. The SWUs Remedial Design will be fully presented in the Area 2, Phase I Integrated Remedial Design Package (IRDP). The Area 2, Phase I IRDP will consist of:

- Area 2, Phase I Implementation Plan
- Excavation Phase - Construction Drawings

- Excavation Phase - Technical Specifications
- Systems Plan.

This Site Preparation Plan and associated draft documents [site preparation phase construction drawings and technical specifications, and Surface Water Management Plan (DOE 1997)] have been separated from the formal IRDP for early submittal and concurrence from regulatory agencies. This early submittal supports the effort to begin site preparation activities in 1997 and the initiation of excavation activities in 1998.

1.4 Objective of Site Preparation

The objective of site preparation is to prepare the site and establish support facilities for the subsequent excavation phase. No impacted material will be removed from the vicinity of the SWUs during site preparation. Completion of site preparation will allow the excavation phase to begin in 1998 and be performed more efficiently.

There is minimal environmental risk associated with the site preparation activities because:

- No material will leave the vicinity of the SWUs during site preparation.
- All material moved within the area will be tracked and documented.
- Only certified soil will be placed in non-impacted stockpiles.
- Disposition of the impacted stockpile material will subsequently occur in accordance with the approved approach defined in the Area 2, Phase I IRDP.
- None of the site preparation activities is permanent construction, and as such, the retention basins will be excavated and certified as the final step of the Area 2, Phase I remediation activities.

This last point indicates that all proposed site preparation features will be removed in the future as part of the remediation process. While the intent is to certify some excavated material for later use as non-impacted fill (for waste minimization and to avoid unneeded disposal), future certification activities conducted as part of Area 2, Phase I will address the entire SWUs project footprint including those areas affected by the proposed site preparation activities.

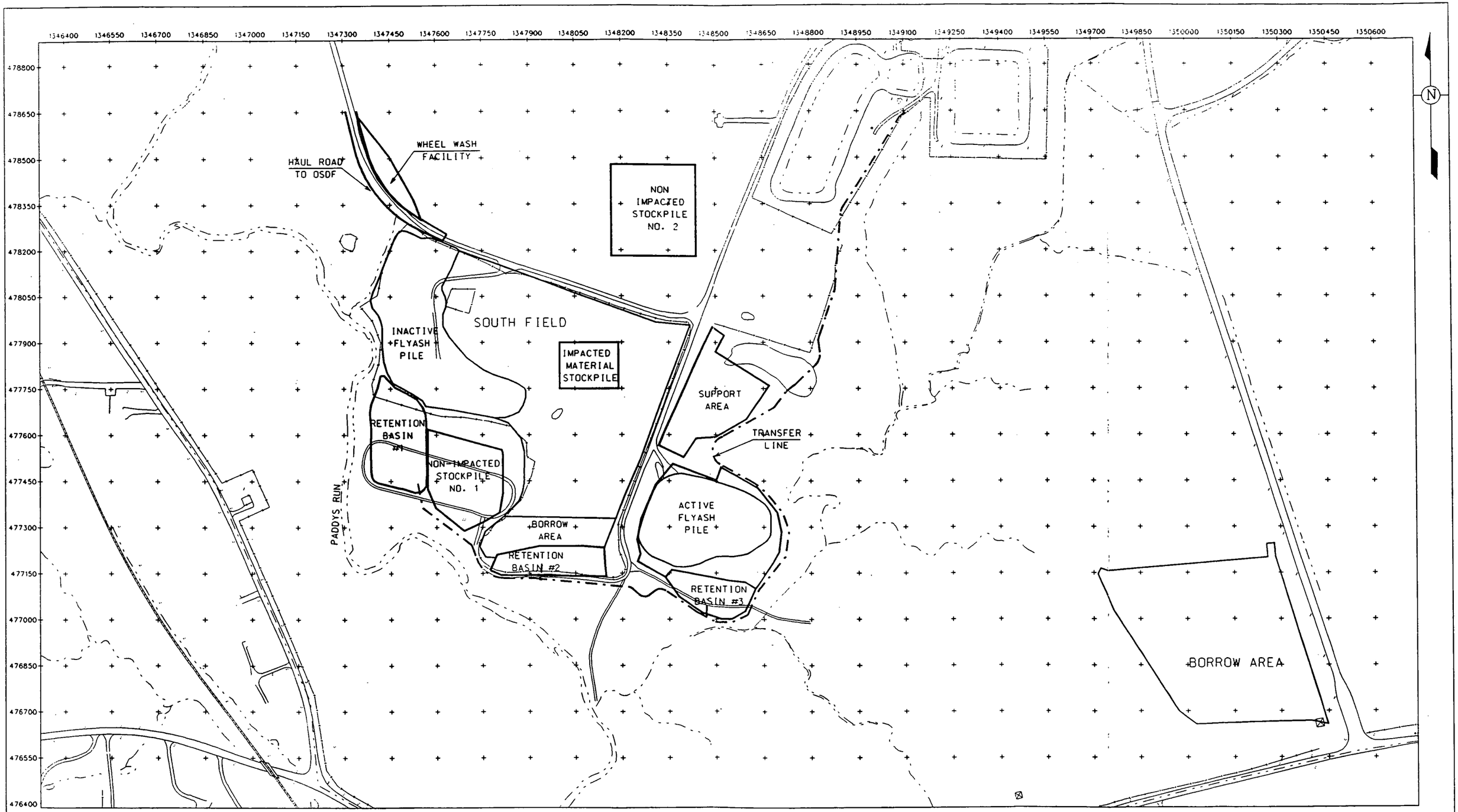

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FIGURE 1-1. AREA 2, PHASE I SITE PREP COMPONENTS

2.0 DESCRIPTION OF WORK

Major site preparation activities will include:

- Establishing site boundaries and access controls
- Establishing construction support facilities and utility installation
- Clearing trees and brush and limited grinding of stumps
- Installing water management ditches, berms and other components
- Installing erosion and sediment controls
- Constructing retention basins and associated piping
- Developing and excavating the borrow area
- Excavating impacted soil and constructing an impacted material stockpile
- Excavating non-impacted soil and constructing non-impacted material stockpiles
- Tracking soil within the SWUs area.

These activities are illustrated on the accompanying construction drawings and are described in the technical specifications. Generally, all construction activities will be performed by a subcontractor to Fluor Daniel Fernald, Inc. (FDF).

As described in Section 4.0, FDF will perform sampling and analysis for WAC attainment of material being placed in the impacted stockpile and to confirm that above-FRL material is not placed on the non-impacted material stockpiles prior to, and during, site preparation.

2.1 Establishing Site Boundaries and Access Controls

Initial preparation of the SWUs area will include establishing the defined construction area by use of construction fencing and signs. The construction fence will also define the control boundary for the Area 2, Phase I site. Fencing and gates will be installed at vehicle access points.

2.2 Establishing Construction Support Facilities and Utility Installation

Construction support facilities will be established and utilities will be installed during site preparation. Construction support facilities will consist of a support area and a wheel wash facility. The support area will include a radiological control point facility, office and storage trailers, parking, laydown area, restroom facilities, and other subcontractor facilities. The wheel wash facility will be a concrete

pad equipped with splash guards and a source of water to remove visible mud, debris, and impacted materials from the body, wheels, and undercarriage of construction vehicles entering the Impacted Material Haul Road. Construction support facilities will be used by the excavation subcontractor during the subsequent waste excavation phase. This waste excavation phase is not addressed by this package.

Water and electric utilities will be installed for lighting, alarms, subcontractor facilities, equipment and radiological control point facilities, and retention basin pumps (lift stations) and controls. Water lines will be installed in three locations: the wheel wash facility, the radiological control point facility, and a yard hydrant (to be used as a source of water for dust control). Electricity will be installed to provide power to the trailers, retention basin lift stations, and the wheel wash facility. Electric power lines will also be extended to the locations of the pump houses for the South Field Extraction System project located in the area of the SWUs. Pipelines for the retention basins and South Field Extraction System will also be installed during site preparation.

2.3 Clearing Trees and Brush and Limited Grinding of Stumps

Trees and brush will be cleared in phases within the SWUs area. Initially, the areas on which site preparation facilities will be constructed (basins, ditches, etc.) will be cleared. After the ditches and basins are constructed, the remainder of the SWUs area will be cleared. Cleared trees and brush will be shredded and stockpiled.

The shredded trees and brush will be placed on a woodchip stockpile located in a clearing just north of the SWUs. This stockpile will be managed by the site preparation and excavation subcontractors. It will be later used for mulch and for soil amendment during the restoration phase of the project.

The woodchip stockpile will be located approximately 500 feet from Paddys Run. Run-off from the woodchip stockpile will eventually flow into Paddys Run. Due to the bio-degradation process, slight increases in loadings and observed values for conventional pollutants such as biological oxygen demand, chemical oxygen demand, total suspended solids, pH, color, and turbidity are likely to be associated with stormwater discharges from the woodchip stockpile. However, discharges from these areas are not anticipated to contribute to the eutrophication of Paddys Run since their small volume and intermittent

nature will render them innocuous when mixed with the larger volume of run-off available within Paddys Run during a typical storm event.

Stormwater discharge from the woodchip stockpile will be considered industrial in nature, and therefore can be managed under the terms and conditions of the existing FEMP National Pollutant Discharge Elimination System (NPDES) permit. Run-off from the SWUs woodchip stockpile will flow through NPDES Discharge Point 4004 along Paddys Run. The current permit specifies bi-annual monitoring for conventional pollutants and therefore, additional monitoring of run-off from the woodchip stockpile are deemed unnecessary at this time.

Within the areas that will be excavated during site preparation (e.g., basins, stockpile footprints, ditches, etc.) stumps will be ground in place, mixed with the top foot of soil and treated as impacted material as described in Section 2.7. Stumps in areas that will not be excavated during site preparation will be left in place, not ground. This will minimize the size of the disturbed area during site preparation. Disturbed areas will be mulched and seeded unless subsequent site preparation construction is occurring in the area.

2.4 Installation of Surface Water Management Ditches, Berms and Other Components

A surface water management system was designed and will be installed to provide both stormwater management and erosion and sedimentation control. The surface water management system will start operating during site preparation and continue through the excavation phase. A detailed description and calculations used to determine types and sizes of the surface water management system components are presented in the Surface Water Management Plan (SWMP; DOE 1997) and are summarized in Section 3.0 of this document.

Run-off from disturbed areas will be collected in retention basins and pumped and treated through the FEMP Stormwater Retention Basin (SWRB). Water in the SWRB will then be conveyed to the Advanced Wastewater Treatment (AWWT) facility in accordance with the OU5 Record of Decision (ROD; DOE 1996a) and NPDES requirements.

Run-on from upgradient and uncertified areas will be controlled by ditches located north of the SWUs area, and north and east of the support area. These ditches and berms are shown on the construction

drawings; calculations used to determine the run-off conveyance areas are presented in the SWMP.

2.5 Installation of Erosion and Sediment Controls

The surface water management system described in Section 3.0 will also provide erosion and sedimentation control. This system is further detailed in the construction drawings and specifications and the SWMP. In addition to the ditches and basins that will minimize and control erosion, silt fence, temporary seeding, permanent seeding, and dumped rock will be utilized. Areas to be temporarily seeded include the borrow and other cleared areas.

2.6 Construction of Retention Basins and Associated Piping

Three retention basins will be constructed south of, and adjacent to, the SWUs. These basins were designed to handle run-off from the modeled 10-year, 24-hour storm. They exceed the design criteria in the Ohio Department of Natural Resources guidelines. As summarized in Section 3.0 and described in the SWMP, these basins will control run-off and prevent the direct discharge of run-off from the SWUs to Paddys Run. The basins will be lined to minimize the potential of water to infiltrate into the Great Miami Aquifer (GMA). As described in Section 3.2.3, the basin liner system will consist of a flexible membrane liner and one foot of compacted clay. The clay for the liner system will be obtained from the West Field Borrow Area located approximately 1000 feet east of the SWUs (See Figure 4-1).

2.7 Borrow Area Development and Excavation

Clay material (approximately 3500 cubic yards) to line the basins will be obtained from the West Field Borrow Area. FRL sampling and analysis will be performed in this area prior to borrow operations as described in Section 4.1. The size of the disturbed area will be minimized; just enough area will be disturbed to obtain the required quantity of material. Borrow area development will include:

- Installation of silt fence and construction fence
- Top soil stripping and stockpiling
- Excavation, regrading and restructuring.

2.8 Excavating Impacted Soil and Constructing an Impacted Material Stockpile

As shown on the construction drawings, the top 6 inches to 12 inches of soil from the three basins will be stripped and treated as impacted material. Material excavated from ditches will also be considered impacted. This material will be placed in the impacted material stockpile located on the South Field. Surface controls, e.g. mulch and seed or crusting agent, will be applied and maintained on the stockpile to minimize erosion. This material will be transported to the OSDF during the Area 2, Phase I excavation phase. Material from the south end of the South Field will be excavated to construct Basin No. 2 and placed in the impacted material stockpile.

2.9 Excavating Non-Impacted Soil and Constructing Non-Impacted Material Stockpiles

Following initial soil stripping and excavation of impacted material from the vicinity of Basin No. 2, non-impacted soil from the three basins will be excavated. Verification that this soil is certified as non-impacted will be addressed by sampling and analysis activities described in Section 4.1. This non-impacted soil will be placed in stockpiles as indicated in design sheets G0005 and G0008. These stockpiles will be separated from the underlying soil by a geomembrane. Surface controls, e.g. mulch and seed or crusting agent, will be applied and maintained on the stockpiles to minimize erosion.

2.10 Tracking Soil within the SWU Area

The specific work areas within the project area have been assigned a designation to use to track movements of soil from one area to another. This tracking will enable the existing and any precertification analytical data to follow with the soil. There will be data to use to determine WAC attainment at the time the soil is moved to its final disposition in the OSDF. The OSDF WAC attainment process for this project is addressed in Section 4.2 of this document.

3.0 SURFACE WATER MANAGEMENT SYSTEM

The Surface Water Management Plan (DOE 1997) was prepared to address management of surface water at the SWUs during site preparation and excavation; it will be provided with design documentation. The SWMP describes the surface water management components and procedures that will be constructed and utilized at the SWUs to control erosion and sedimentation, stormwater, and other surface water issues.

3.1 Overview of Surface Water Management System

Major components of the surface water management system will be constructed during the site preparation phase. These components will begin operating during site preparation and continue through excavation. Major components of the system include:

- Run-on control ditches and related devices
- Collection ditches and related devices
- Retention basins
- Transfer line
- SWRB and AWWT facilities

A detailed description of, and calculations used to, determine types and sizes of the surface water management system components are contained in the SWMP. The location and details of the components in the SWUs area are illustrated on the construction drawings and technical specifications.

3.2 Description of Surface Water Management System

The overall operation of the surface water management system was designed and will be constructed to minimize generation of contaminated run-off, and to collect and treat potentially contaminated surface water prior to discharge. Run-on control ditches and berms will be constructed during site preparation to prevent water from upgradient areas from flowing into and/or across the construction area. These run-on control ditches and berms will remain after remediation to prevent potential recontamination. Run-off (which is potentially contaminated) from disturbed areas will drain via collection ditches which will convey the run-off to three retention basins. These retention basins will

provide temporary storage while allowing for additional sediment removal capacity and stormwater control. Water from the retention basins will be conveyed to the FEMP SWRB via a new transfer line. Water from the SWRB will then be conveyed to the AWWT facility for treatment prior to discharge. Run-on control and collection ditches and the retention basins were designed and will be constructed to handle the 10-year, 24-hour storm event. Water from the retention basins will then be pumped to the SWRB and subsequently to the AWWT facility for treatment.

Stormwater and erosion and sediment control measures will also minimize release of radiological contaminants. The SWMP procedures will be a guide to minimize construction-related impacts on water quality from erosion and sedimentation, and minimize the spread of contamination during remediation of the SWUs. During remediation, FDF will perform required NPDES monitoring at the permitted stormwater outfalls and comply with all applicable Federal, State, DOE, and FEMP requirements.

3.2.1 Run-on Control Ditches and Related Devices

Run-on from upgradient areas will be collected and diverted around the excavation area via run-on control ditches and related devices generally located north of the SWUs; these ditches will be constructed during site preparation.

A ditch (designated as D-12 on the construction drawings) north of the existing road that runs along the northern edge of the IFP and SF will be constructed to intercept run-on and convey this water westward to a new pipe under the road and into an existing catch basin. Water from the catch basin will discharge through an 18-inch corrugated polyethylene pipe to an existing drainage way and through the existing NPDES Discharge Point No. 4004 at Paddys Run. An earthen berm will be constructed around the existing catch basin to collect potential run-on water from the south side of the road and prevent potentially contaminated run-off from entering the system. The existing 18-inch pipe will be extended to ensure that discharge flows through the existing NPDES Discharge Point No. 4004.

An earthen berm will be constructed across a topographically low area north of the AFP to ensure that run-on water will not enter the AFP remediation area.

3.2.2 Collection Ditches and Related Devices

During site preparation, collection ditches will be constructed around the perimeter of the remediation/construction area to collect and convey stormwater run-off to the three retention basins. Where possible, the channel slopes will follow the existing topography to minimize excavation. The ditches will be trapezoidal (flat bottom) or triangular in shape depending on anticipated flow rates and site constraints. All ditches will be lined to prevent channel erosion with either an erosion control blanket or dumped rock, depending on the design flow velocities. (See Summary of Ditch Performance, Sheet B34, Appendix A in SWMP.) Collection ditches excavated into the sand and gravel of the Great Miami Aquifer (GMA) will be lined with a 60 millimeter high density polyethelene (HDPE) flexible membrane liner. The flexible membrane liner is sufficient to line the collection ditches because there will be no standing water in the ditches and there will be a regular inspection and maintenance program.

3.2.3 Retention Basins

The SWUs project area is divided into three major drainage areas based on existing topography (drainage areas). Three retention basins, one per drainage area, will be constructed during site preparation to control and collect potentially impacted stormwater run-off.

The basins will be constructed via excavation. Surface soil excavated from the area of the basins will be considered impacted material. Subsurface soil will be considered non-impacted based on FRL samples and analyses as described in Section 4.0, and placed in non-impacted soil stockpile No. 1 located east of Basin No. 1, and in non-impacted stockpile No. 2 located north of the South Field as indicated on the construction drawings. Material in the non-impacted soil stockpile will be used to reclaim the retention basins during the restoration phase of the project, or during other final grading activities.

As shown on the construction drawings (Sheet Nos. G0009, G0010, and G0011), the basins will be excavated into the unsaturated sands and gravels of the GMA. The average groundwater levels under Basin No. 1 are approximately 10 feet below the bottom of the basin. The basins will have a liner system to minimize potential infiltration into the GMA from accumulated water. The primary objective of the liner system will be to ensure that the environment is not adversely impacted during remediation of the SWUs; contamination should not spread at the SWUs during remediation. The

liner system will contain water from the 10-year, 24-hour storm event within the basin, withstand potential animal impacts, e.g. punctures caused by deer, and have the ability to be cleaned to remove accumulated sediments. The liner itself will be part of a system which will also include:

- An inspection and maintenance program
- Erosion and sediment control practices up-gradient of the basins
- Pumping accumulated water to minimize head on the liner
- Fencing to restrict access.

The basin and liner system is scheduled to operate for two years but will be designed to function for five years. The liner system proposed for the basins will consist of (from top to bottom) the following layers:

- 60 mil HDPE geomembrane
- Twelve inches of compacted clay
- Existing sands and gravels of the GMA.

This combination (geomembrane and clay) liner system will meet the requirements of the project. Sediment will be removed by a slurry suction process.

Borrow material for the twelve inches of compacted clay will be obtained from the West Field Borrow Area which is located west of the South Access Road. Extensive geotechnical testing has been performed on the material in the West Field Borrow Area. The results of the geotechnical testing are presented in the "Geotechnical Data and Evaluation Report for East and South Field Borrow Areas" prepared in June 1996 (DOE 1996a). Soils from four borings in the area (Nos. 72, 74, 75, and 154) are classified as clay (CL) material. Permeabilities of two remolded samples collected from Boring 74 were 1.2 x 10^{-8} cm/sec. This permeability was based on soil compacted to 95% standard proctor at +4% of optimum moisture content.

A certification unit (CU) will be established in the area and certification sampling and analysis will be completed before the material is used for the basin liner. The CU will be sampled and analyzed to certify that the COCs are below FRLs prior to placement in the vicinity that will encompass the entire

borrow area and basins (See Section 4.1). After remediation and certification of the SWUs are complete, the liner material from the basins (HDPE and clay) will be removed and the area of the basins sampled and remediated until it is certified.

Each retention basin will have a lift station system and overflow outlet. The lift station system will consist of a riser, manhole, pump, and related piping/wiring/etc., and will be located adjacent to each basin. An HDPE riser pipe will be installed inside each basin to drain the basins. The HDPE riser pipes in all three basins will be perforated to the bottom of the basins. The perforations will be one inch diameter holes. Aggregate with an approximate size of two inches will be piled against the riser to the sediment clean-out level. The aggregate will filter and slow the flow into the riser without excessive restrictions while providing the ability for the basins to dewater via gravity flow. Wrapping the riser with filter fabric was considered but was not proposed in order to allow for efficient dewatering of the basins. Also, the fabric was not considered necessary because water from the SWU basins is pumped to the SWRBs where additional sedimentation capacity is provided.

Water will gravity flow into the riser and then through a pipe to a manhole where it will be pumped to the SWRB. Construction details for the riser and manhole lift station are shown on the construction drawings. Overflow outlets will be provided for all three basins; the overflow outlets will consist of open, trapezoidal channels with invert elevations above the top of the riser pipe and below the top elevation of the basin embankment. The overflow outlets will not discharge unless the 10-year, 24-hour storm event is exceeded. However, all three basins are located in the 100-year floodplain. A preliminary calculation performed for a previous project indicates that run-off from the 25-year storm will flood the area of the basins and will likely overtop the retention basins. Therefore, in the event of a storm that exceeds the 10-year, 24-hour storm event during the two year construction period, water may flow into, rather than out of, the overflow outlets. During flows that exceed the 10-year storm, the SWRB will bypass the AWWT and discharge directly to the Great Miami River. During these periods of stormwater bypass, the manhole pumps from the retention basins will not operate.

3.2.4 Transfer Line

A double-walled HDPE pipe will be installed to convey run-off collected in the retention basins to the SWRB. The main transfer line begins at the manhole lift station at Basin 1 and proceeds in an

eastward direction where the lift stations for Basins 2 and 3 discharge into the transfer line. From Basin 3 the transfer line runs northward, east of the AFP, until reaching the termination point at the SWRB diversion box (see construction drawings). Cleanouts will be provided at strategic low points along the run of pipe. Air relief valves will be provided at strategic high points.

3.2.5 SWRB and AWWT

The SWRB will receive all water pumped from the SWUs retention basins. Under normal conditions, the SWRB is pumped to the AWWT facility for treatment and discharge, consistent with the NPDES and OU5 ROD requirements.

3.3 SWRB Capacity

Capacity in the SWRBs to handle the additional water from the SWUs retention basins will be provided by the FEMP parking lot diversion project which will be completed in the summer of 1997. Currently, surface water run-off from the FEMP parking lot discharges into the SWRBs. When construction of the parking lot diversion project is completed in the summer of 1997, there will be additional capacity provided for run-off from the SWU retention basins into the SWRB and AWWT.

The FEMP parking lot that currently discharges to the SWRB covers approximately 11.6 acres. The total drainage area that will flow into the SWU retention basins is 24.5 acres. However, the total volume of run-off from each area is approximately equal because the parking lot is paved and generally impermeable; and the drainage area to the SWU retention basins is covered with soil (including the permeable sand and gravel material of the GMA), and is currently vegetated. Also, the maximum flow to the SWRB will be 600 gallons per minute (gpm) from the lift station pumps, and the estimated parking lot flow from the SWRB to the AWWT is 700 gpm. Therefore, there will be sufficient capacity created in the SWRB to handle run-off from the SWUs when the parking lot diversion project is completed.

3.4 Erosion and Sedimentation Control

The surface water management system will provide erosion and sedimentation control by controlling and treating surface water run-off from active areas of excavation. There will be no direct discharge of run-off from the SWU project.

In addition, other soil conservation practices (e.g., combining vegetative and structural measure), have been incorporated in construction documents to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. Many of these measures will be long-term in nature and will become part of the completed construction project; i.e., grading and permanent seeding. Other measures will be temporary and will be removed by the excavation subcontractor at the completion of excavation and restoration. The selection of erosion and sediment control measures was based on several general principles including the following:

- Minimization of erosion through project design
- Incorporation of temporary and permanent erosion control measures
- Removal of sediment prior to discharge.

Erosion and sediment control measures planned for the SWUs project incorporate applicable State, Federal, DOE, and FEMP requirements. The FEMP standards for erosion and sediment control follow the Ohio Department of Natural Resources (ODNR) and United States Soil Conservation Service standards for construction and materials. Vegetative stabilization, silt fencing, and ditch protection will be implemented in accordance with Ohio Department of Transportation Construction and Material Specifications and the Location and Design Manual, Volume Two, "Drainage Design" (ODOT 1992). A generalized description of proposed erosion and sediment control measures is presented in the SWMP. Construction details for erosion and sediment control measures are included in the construction drawings and specifications.

4.0 FRL CERTIFICATION AND WAC ATTAINMENT

4.1 FRL Certification

The purpose of certification is to permit (1) the utilization of non-impacted soil for future backfill and grading activities, and (2) the use of borrow area material for basin liner construction. Another benefit of certifying soil is that it minimizes material to be placed in the On-Site Disposal Facility (OSDF). The areas to be certified during site preparation are associated with the soil to be excavated from the three basins for placement in the non-impacted stockpile and soil to be used for lining the basins.

Prior to excavating non-impacted material from the IFP, AFP, and SF basins, the site preparation subcontractor will excavate 6 to 12 inches of suspected impacted, but below-WAC, material from the surface of those areas. Impacted material from the SF (in the vicinity of Basin No. 2) will also be excavated prior to excavating the non-impacted material below. That material is suspected to be impacted based on Remedial Investigation/Feasibility Study (RI/FS) data, process knowledge, and visual observation of ash in these locations. The certification sampling and analysis will demonstrate at what depth the material below the surface material meets FRLs. This approach to certification is anticipated to be sufficient based on the assumption that contamination in these areas is top-down. In other words, contamination in these areas is thought to be due to the following mechanisms:

- At the AFP and SF basin areas
  - Air deposition during dumping at the SF and AFP
  - Sediment deposition from the SF and AFP
- At the IFP basin area
  - Air deposition during dumping at the SF and IFP
  - Placement of ash for construction of running track and adjacent exercise/training facilities
  - Surficial regrading of the area during construction of running track and adjacent exercise/training facilities
  - Sediment deposition from the IFP (north end of basin only).

Surface material and material from the SF will be placed on the impacted stockpile in the SF. After removal of the surface material, remaining material in each of the basin areas should be native soil. As such, any contamination should exhibit a concentration gradient from highest at the surface to lesser concentrations at greater depths. Therefore, certification of upper soil levels will indicate that deeper material also meets FRLs.

The areas to be certified are divided into proposed CUs as shown on Figure 4-1. There are two CUs for the IFP basin (IFP-B1 and IFP-B2) and one CU each for the AFP basin (AFP-B), the SF basin (SF-B), and the Borrow Area. The areas of the CUs are presented in Table 4-1, Certification Units for SWUs Site Preparation.

The CUs were delineated to provide the following:

- Bound the areas that will be the sources for suspected non-impacted material
- Have an area no greater than 1.0 acre in the vicinity of the SWUs
- In the case of IFP-B1 and IFP-B2, the units were divided just south of the gravel road south of the IFP. This separates the running track area from the immediate vicinity of the IFP, increases the likelihood that each CU is homogeneous with respect to contamination, and ensures a higher density of sampling close to the IFP.

The approach to be used for sampling, testing, and statistical analysis in this work is similar to, though somewhat more conservative than, the certification approach used in Area 1, Phase I at the FEMP site. Sixteen sample locations will be established in each CU. The samples will be located by dividing each CU into sixteen subparts and randomly placing a sample within each subpart.

Sampling in the basin CUs will be done by geoprobe with the field sampling and analysis activities performed as presented in Table 4-2, Retention Basin Certification Activities. Screening analyses will be performed on four samples from each depth interval within each CU, a total of sixteen per retention basin CU. At a minimum, screening will address uranium-238. If a screening result is above the FRL, that depth interval within that CU will be considered to have failed screening. Sixteen (16) samples will be analyzed for all area-specific contaminants of concern (ASCOCs). Certification sampling/analysis activities will be presented in a Project Specific Plan prior to the initiation of field sampling.

TABLE 4-1
CERTIFICATION UNITS FOR SWUs SITE PREPARATION

Certification Unit	Area (acres)
IFP-B1	0.3
IFP-B2	1.0
SF-B	0.5
AFP-B	0.5
BA	6.3

TABLE 4-2
RETENTION BASIN CERTIFICATION ACTIVITIES

Depth (inches)	Activity
0-6	Discard
6-12	Sample for screening analysis Sample for FRL analysis Perform screening analysis Perform FRL analysis if screening is successful
12-18	Sample for screening analysis Sample for FRL analysis Perform screening analysis Perform FRL analysis if . . . (1) Screening is successful, and (2) The 6-12 inch interval fails either screening or FRL certification.
18-24	Sample for screening analysis Sample for FRL analysis Perform screening analysis Perform FRL analysis if . . . (1) Screening is successful, and (2) The 12-18 inch interval fails either screening or FRL certification.
24-30	Sample for screening analysis Sample for FRL analysis Perform screening analysis Perform FRL analysis if . . . (1) Screening is successful, and (2) The 18-24 inch interval fails either screening or FRL certification.
>30	Not Applicable

If a CU fails certification at the 24-30 inch sample interval, it will be assumed to be impacted to the proposed extent of the basin excavation and that material will be placed in the impacted stockpile. If multiple CUs fail at the 24-30 inch interval, one or both non-impacted stockpiles will be redesignated as impacted.

Since the OU2 parameters were specific to the SWUs area of the FEMP, ASCOCs for the retention basin CUs are based on the OU2 ROD (DOE 1995) for all four CUs. The following changes were made to the OU2 parameters:

- Total uranium was removed since the more stringent uranium-238 value envelopes the total uranium requirement.
- Radium-228 and Thorium-228 were removed as FRLs because they are part of the Thorium-232 decay chain. Since the daughter isotopes would be in secular equilibrium with thorium-232, analyses for these two parameters are considered redundant when thorium-232 analyses are already proposed.

The FRLs to be utilized during certification are a compilation of FRLs that were designated for COCs in the OU2 ROD for the IFP, SF, and AFP. The most stringent FRL for each COC was adopted for certification. Additionally, if an FRL existed for one of the SWUs FRLs compiled from the OU2 ROD as a more stringent OU5 FRL, the OU5 FRL was adopted, e.g., technetium-99 and arsenic. The ASCOCs and their FRLs, as applied to these CUs, are presented in Table 4-3, Site Preparation Retention Basin FRLs.

Failure of a retention basin CU for a particular ASCOC will be defined as:

- Upper Confidence Level of the mean exceeding the FRL for the confidence level presented in Table 4-3,
- Any individual analytical result of more than twice the FRL.

The confidence levels are based on Area 1, Phase I practices and designate higher confidence requirements for uranium (as uranium-238) and specified radium and thorium isotopes than for the other ASCOCs.

Certification results for the retention basin CUs will be presented in a certification completion letter which will be submitted to the regulatory agencies prior to use of non-impacted stockpile material for backfill or grading.

TABLE 4-3
SITE PREPARATION RETENTION BASIN FRLs

ASCOC	Units	FRL	Confidence Level (%)
Radium-226	pCi/g	1.7	95
Thorium-232	pCi/g	1.5	95
U-238	pCi/g	3.22	95
Aroclor-1260	mg/kg	0.13	90
Arsenic	mg/kg	12	90
Benzo(a)pyrene	mg/kg	0.777	90
Benzo(b)fluoranthene	mg/kg	0.513	90
Benzo(a)anthracene	mg/kg	0.455	90
Benzo(k)fluoranthene	mg/kg	0.603	90
Dibenzo(a,h)anthracene	mg/kg	0.157	90
Dieldrin	mg/kg	0.00957	90
Indeno(1,2,3-cd)pyrene	mg/kg	0.496	90
Lead	mg/kg	400	90
Neptunium-237	pCi/g	3.2	90
Phenanthrene	mg/kg	0.19	90
Technetium-99	pCi/g	30	90
Thorium-230	pCi/g	6.97	90
U-234	pCi/g	4.24	90
U-235/236	pCi/g	3.35	90

The West Field Borrow Area (see Sections 2.6 and 3.2.3 and Figure 4-1) will also be certified prior to excavation. Because this area was not used for any production era activities, and is not downgradient of known impacted areas, the borrow area is thought to be subject to only airborne deposition of contamination. Thus, this area is considered to be homogeneous with respect to contamination and will be treated as a single certification unit. Also, surface certification will be considered representative of the deeper material to be utilized as borrow.

Based on RI/FS data and production knowledge, the ASCOCs for the borrow area will be the same as used in Area 1, Phase II, with the exception of Total Uranium, which is replaced by Uranium-238:

FRLs are the more stringent of OU2 and OU5 values. Certification determination would be based on 16 systematic random samples analyzed as follows:

- Upper Confidence Level of the mean exceeding the FRL for the confidence level presented in Table 4-4, Site Preparation Borrow Area FRLs
- Any individual analytical result of more than twice the FRL.

Certification results for the borrow area will be submitted to the regulatory agencies in a letter report prior to use of the area in construction.

TABLE 4-4
SITE PREPARATION BORROW FRLs

ASCOC	FRL	Units	Confidence Level (%)
Uranium-238	3.22	pCi/g	95
Radium-226	1.7	pCi/g	95
Thorium-232	1.5	pCi/g	95
Arsenic	12	mg/kg	90
Beryllium	1.5	mg/kg	90

4.2 WAC Attainment

The purpose of WAC attainment is to ensure that material placed in the impacted stockpile does not exceed the WAC for on-site disposal. This will allow future placement of this material from the impacted stockpile into the OSDF and eliminate concerns about this material cross-contaminating other material in the South Field during the interim.

This section offers an interim approach for WAC attainment in the areas involved in site preparation in the OU2 SWUs vicinity. This approach is not intended to establish a precedent for the FEMP as a whole, but is proposed as a conservative means of demonstrating WAC attainment prior to site preparation activities to be implemented in 1997.

This approach addresses the three SWUs ASCOCs that have WAC -- total uranium, technetium-99, and neptunium-237.

Total Uranium. Current knowledge of the AFP, SF, and IFP indicates that certain portions of the IFP and SF contain materials that exceed on-site WAC for total uranium (see Figure 4-2, South Field Area RI/FS Sample Locations Total Uranium). These same data indicate that the majority of the SWUs vicinity, including the areas within the scope of site preparation activities (as presented in Figure 4-3, Site Preparation WAC Areas), is not expected to contain material above the total uranium WAC. While none of the site preparation area is expected to contain above-WAC material, a total uranium monitoring program is proposed to (1) provide further confirmation of that assumption and (2) provide delineation of above-WAC materials if they are found to be present in site preparation areas.

The proposed WAC attainment program for total uranium in site preparation areas is presented in Table 4-5, Total Uranium WAC Attainment Monitoring. That program is a combination of real-time screening techniques and physical samples taken for laboratory analysis.

The determination for total uranium WAC attainment will be based on the concentrations shown in Table 4-6, Total Uranium WAC Attainment Concentrations.

These conservative values avoid misclassification of above-WAC material. The areas outside the SWUs boundaries have lower segregation values, reflecting process knowledge and existing data that indicates that these areas are not expected to exceed the total uranium WAC. The screening values are intended to be such that either current real-time monitoring technique; i.e. high-purity germanium or sodium iodide, is acceptable to achieve that value.

TABLE 4-5
TOTAL URANIUM WAC ATTAINMENT MONITORING

Description	At the surface		At depth	
	Frequency	Basis	Frequency	Basis
Non-fill Areas: • regions outside the SWUs • regions inside the SWUs that are either native material at the surface or covered by only a few inches of sediment	General real-time detector system coverage. Any detects above the screening criterion (500 ppm) will be investigated further using a physical sample at the detect location.	High percentage coverage with real time equipment. Confirmation of high results using physical samples.	Not applicable. Coverage will be limited to the surface only.	See discussion of top-down contamination in Section 4.1. In areas that are undisturbed, have been regraded within the top few inches, or are covered by a few inches of sediment, any above-WAC material should be evident in surface samples.
Fill Areas: • regions within the South Field and Inactive Flyash Pile that are known to contain placed fill materials from the FEMP production era	General real-time detector system coverage. Any detects above the screening criterion (500 ppm) will be investigated further using a physical sample at the detect location.	High percentage coverage with real time equipment. Confirmation of high results using physical samples.	Using Geoprobe, 6 inches of each 2 foot interval from surface to bottom of proposed excavation, at locations as follows: • In narrow areas (<35 feet wide), a biased sample location every 100 feet along the centerline. • In other areas, one sample location for each 3500 square feet.	Addresses heterogeneous material in the waste units. Frequency of Geoprobe locations is similar to sampling density used for most conservative FRL certification in Area 1, Phase I work.

Notes: Sample locations along the ditch centerline will have the flexibility to be field relocated along the centerline plus or minus 4 feet, or perpendicular to the centerline plus or minus 1.5 feet, to avoid obstructions that prevent the acquisition of an acceptable sample.

Real-time detector percentage coverage will be as extensive as possible without destroying root systems of trees and shrubs in the areas, and without jeopardizing worker safety on sloped regions.

TABLE 4-6
TOTAL URANIUM WAC ATTAINMENT CONCENTRATIONS

Location	Screening with Real-Time Instrumentation	Segregation with Physical Sample Results
Inside the SWUs	500 ppm	~85% of the WAC, 850 ppm
Outside the SWUs	500 ppm	~75% of the WAC, 750 ppm

Discovery of any material exceeding the total uranium WAC determination values listed above will result in a re-evaluation of the site preparation activities planned in that location. In doing so, the Project Manager will select one of the following courses of action:

(1) Segregate the material with additional physical samples, place the material in a box (e.g. white metal box or Sea-Land container), and store in the SF for disposition during the excavation phase of the Area 2, Phase I remediation. The segregation sampling would be as follows:

Narrow Areas (e.g. Ditches)

- One sample upgradient along the centerline and another down-gradient along the centerline, each five feet from the original above-WAC sample or at the edge of the proposed excavation, whichever is closer to the original above-WAC sample

- Two samples perpendicular to the centerline (one on each side), 5 feet from the original above-WAC sample or at the edge of the proposed excavation, whichever is closer to the original above-WAC sample

- One sample below the original above-WAC sample at the proposed extent of excavation or 3 feet deeper than the original above-WAC sample, whichever is closer to the original above-WAC sample.

Other Areas

- One sample in each direction (North, South, East, and West), five feet from the original above-WAC sample or at the edge of the proposed excavation, whichever is closer to the original above-WAC sample

- One sample below the original above-WAC sample at the proposed extent of excavation or 3 feet deeper than the original above-WAC sample, whichever is closer to the original above-WAC sample.

In both cases above, the Project Manager could direct excavation of a three dimensional body of material whose corners and depth have been designated by the segregation sampling, or the Project Manager could choose to implement option (2) described below.

(2) Flag the location, leave the material in place, and modify design to avoid the above-WAC region. In the event that this results in excavation in another region, the sampling and analysis would follow the guidelines provided in Table 4-4. This option reflects the philosophy that site preparation activities alone do not achieve remediation; site preparation activities are intended to lay the groundwork for subsequent remedial excavation.

Technetium-99. Current knowledge of the SWUs indicates that one portion of the IFP contains materials that exceed on-site WAC for Tc-99 (see Figure 4-4). The same data indicate that the majority of the SWUs vicinity, including the areas within the scope of site preparation activities (as presented in Figure 4-3), is not expected to contain material above the Tc-99 WAC. Because above-WAC Tc-99 appears to be very localized in the SWUs vicinity, the DOE is implementing a program to reexamine the occurrence of Tc-99 in the SWUs area as part of a sitewide program to examine the occurrence of Tc-99. This program will include the analysis of at least 35 Tc-99 samples from the SWUs area, with emphasis on the vicinity of the above-WAC detection. The results of that program will be used to further delineate that portion of the Inactive Flyash Pile which potentially contains Tc-99 above WAC, and that above-WAC area will be avoided during the site preparation activities.

Neptunium-237. Data for neptunium-237 in the SWUs vicinity is presented in Figure 4-5. Since the WAC for neptunium-237 is 3.12×10^9 pCi/g, it can be seen from the figure that no detected values

were within seven orders of magnitude of the WAC. Therefore, no further consideration of WAC attainment for neptunium-237 is necessary.

Reporting. Following completion of site preparation activities, a WAC attainment report for SWUs site preparation will be provided to the EPAs for review. That report will present sampling locations and analytical results, and summarize soil movement activities during site preparation. The purpose of the report will be to present information supporting the proposed disposition of impacted material during the subsequent excavation activities at the SWUs.

LEGEND:

FEMP BOUNDARY

SCALE

300 150 0 300 FEET

DRAFT

u:\srdig\dgn\map\hor\south\cu-s0005.dgn STATE PLANAR COORDINATE SYSTEM 1927 11-JUN-1997

FIGURE 4-1 SITE PREPARATION CERTIFICATION UNITS.

1347000 1347500 1348000 1348500 1349000

478500 478000 477500 477000

LEGEND

- ○ BELOW 250 PPM
- ⊕ 250 - 500 PPM
- ⊙ 500 - 750 PPM
- ● 750 - 1030 PPM
- ▲ ABOVE 1030 PPM

NOTE : POSTED SYMBOLS BASED ON MAXIMUM RESULT FROM ALL SAMPLES AT LOCATION

FIGURE 4-2

SOUTH FIELD AREA
RI/FS SAMPLE LOCATIONS
TOTAL URANIUM

21-MAY-1997
u:\2cwrl\dgn\bmp\sf_utot.dgn

1346800 1347200 1347600 1348000 1348400 1348800 1349200 1349600

478400

478000

477600

477200

N

LEGEND:

FEMP BOUNDARY

NON-FILL AREAS

FILL AREAS

SCALE

200 100 0 200 FEET

DRAFT

c:\srdig\dgn\map\hor\dpth\greg.dgn STATE PLANAR COORDINATE SYSTEM 1927 03-JUN-1997

FIGURE 4-3. SITE PREP WAC AREAS

LEGEND

- ○ BELOW 10 pCi/g
- ● 20 - 30 pCi/g
- ⊕ 10 - 20 pCi/g
- ▲ ABOVE 30 pCi/g

NOTE : POSTED SYMBOLS BASED ON MAXIMUM RESULT FROM ALL SAMPLES AT LOCATION

FIGURE 4-4

SOUTH FIELD AREA
RI/FS SAMPLE LOCATIONS
TECHNETIUM-99

22-MAY-1997
u:\2cwr1\dgn\bmp\sf_tc99.dgn

1347000 1347500 1348000 1348500 1349000

478500 478000 477500 477000

LEGEND

- ○ BELOW 3.2 pCi/g
- ● 3.2 - 50 pCi/g
- ▲ ABOVE 50 pCi/g

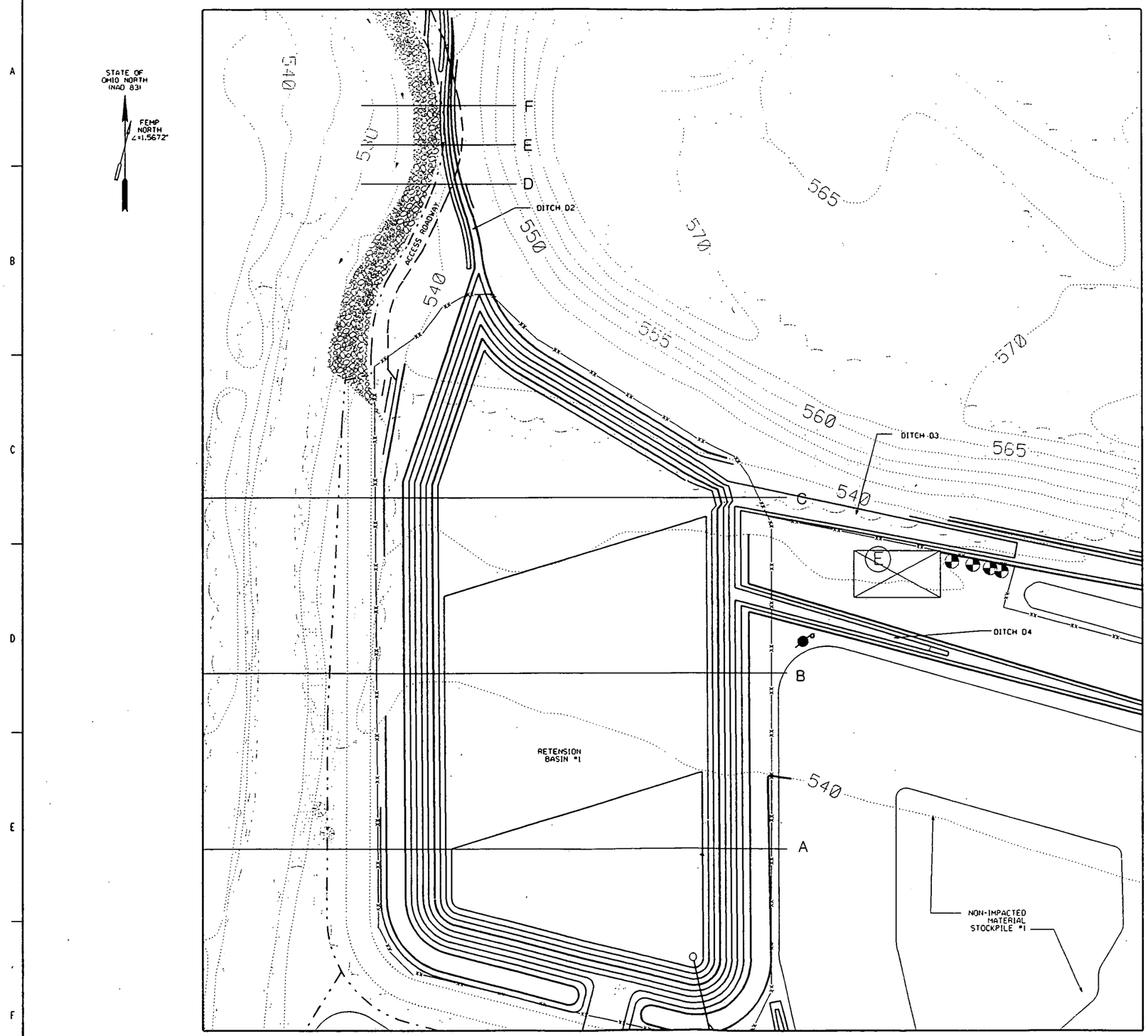
NOTE : POSTED SYMBOLS BASED ON MAXIMUM RESULT FROM ALL SAMPLES AT LOCATION

FIGURE 4-5

SOUTH FIELD AREA
RI/FS SAMPLE LOCATIONS
NEPTUNIUM-237

23-MAY-1997
u:\2cwr1\dgn\bmp\sf_np237.dgn

skg04548.m po165@ws413. Mon Jun 9 08:06:45 CDT 1997



NOTES

FOR INFORMATION ONLY

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E INITIALS AND DATE	FERNCO INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

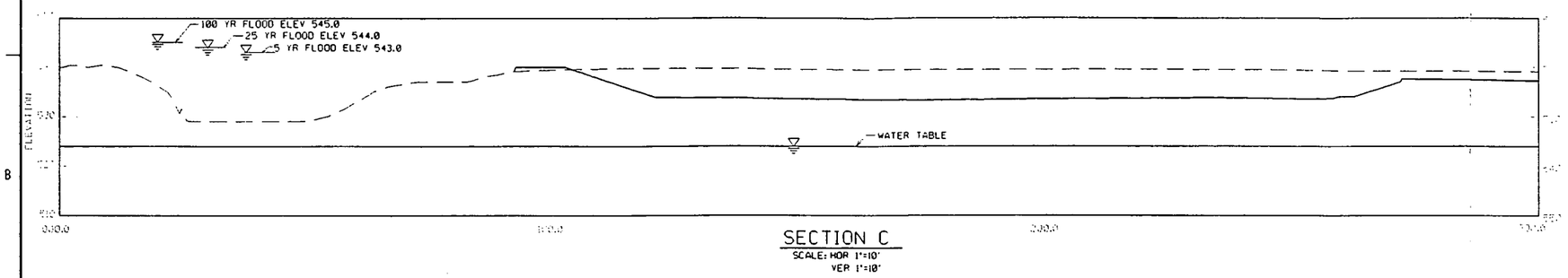
PROJECT NAME
WASTE UNITS REMEDIATION
SOUTHERN WASTE UNITS

DRAWING TITLE
SKETCH #1

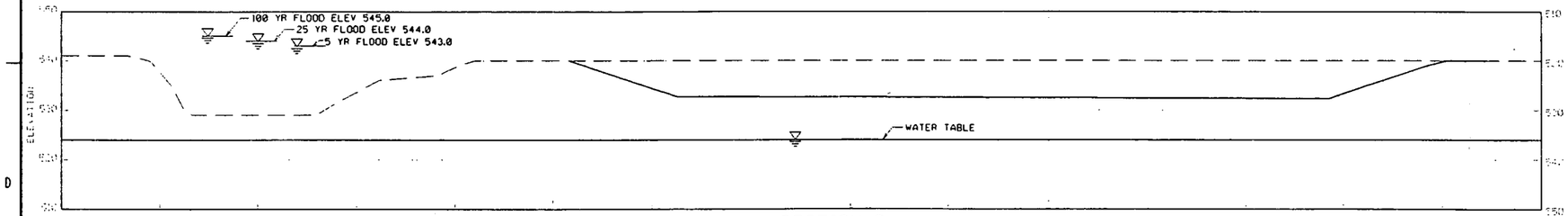
DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
PLANT/BLDG NO.		FLOOR		SCALE 1"=20'	CLASS
SUBMITTED FOR APPROVAL		FERNCO CRU APPROVAL			

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	A-E DOE PROJECT NO.	DATE	TEMP PROJECT NO.	DRAWING REF. CODE NO.	SHEET NO.	REV. NO.
			00-90701	SK-G-004548		A

skg04548.m po165@ws413. Mon Jun 9 08:12:39 CDT 1997



SECTION C
SCALE: HOR 1"=10'
VER 1"=10'



SECTION B
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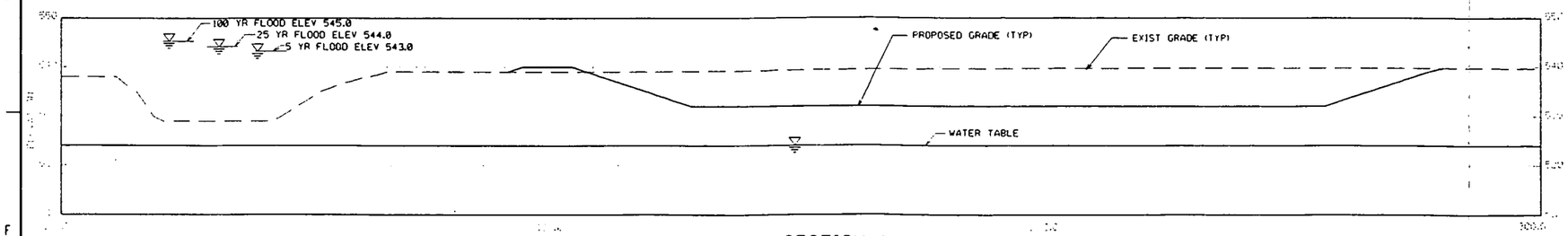
VER 1"=10'



SECTION A
SCALE: HOR 1"=10'
VER 1"=10'

GRAPHIC SCALE: 1"=10' VERTICAL

GRAPHIC SCALE: 1"=10' HORIZONTAL

PREPARED UNDER PARSONS PROJECT ORDER NUMBER

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REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A/E INITIALS AND DATE	FERNALD INITIALS AND DATE	DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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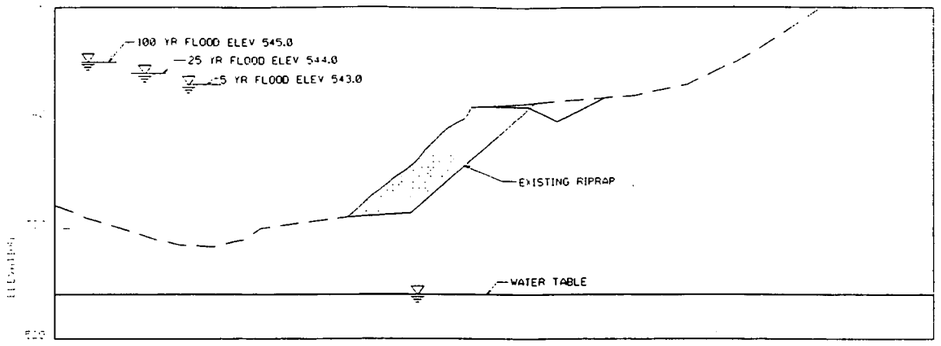
PROJECT NAME
WASTE UNITS REMEDIATION
SOUTHERN WASTE UNITS

DRAWING TITLE
SKETCH #2

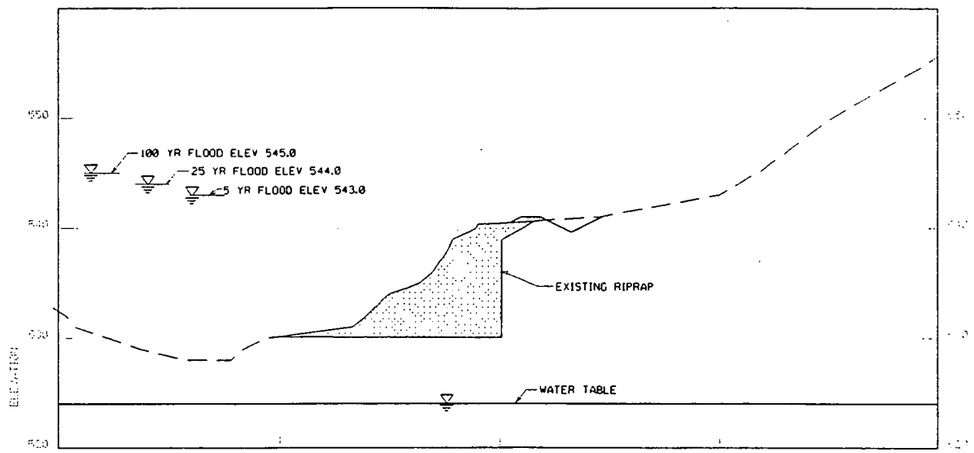
DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
PLANT/BLDG NO.		FLOOR		SCALE 1"=10'	CLASS
SUBMITTED FOR APPROVAL		FERNCO ENV APPROVAL			

A/E DOE PROJECT NO.	DATE	FERNALD PROJECT NO.	DRAWING/PART CODE NO.	SHEET NO.	REV. NO.
		00-90701	SK-G-004548		A

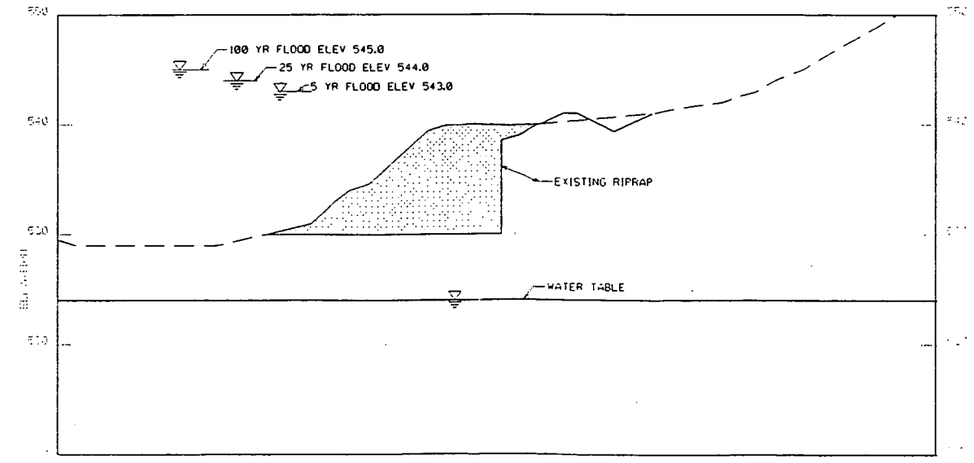
skg04548.m po165@ws413. Mon Jun 9 08:09:49 CDT 1997



SECTION F
SCALE: HOR 1"=5'
VER 1"=5'



SECTION E
SCALE: HOR 1"=5'
VER 1"=5'



SECTION D
SCALE: HOR 1"=5'
VER 1"=5'

NOTES

FOR INFORMATION ONLY

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E INITIALS AND DATE	FERNCO INITIALS AND DATE	DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
WASTE UNITS REMEDIATION
SOUTHERN WASTE UNITS

DRAWING TITLE
SKETCH #3

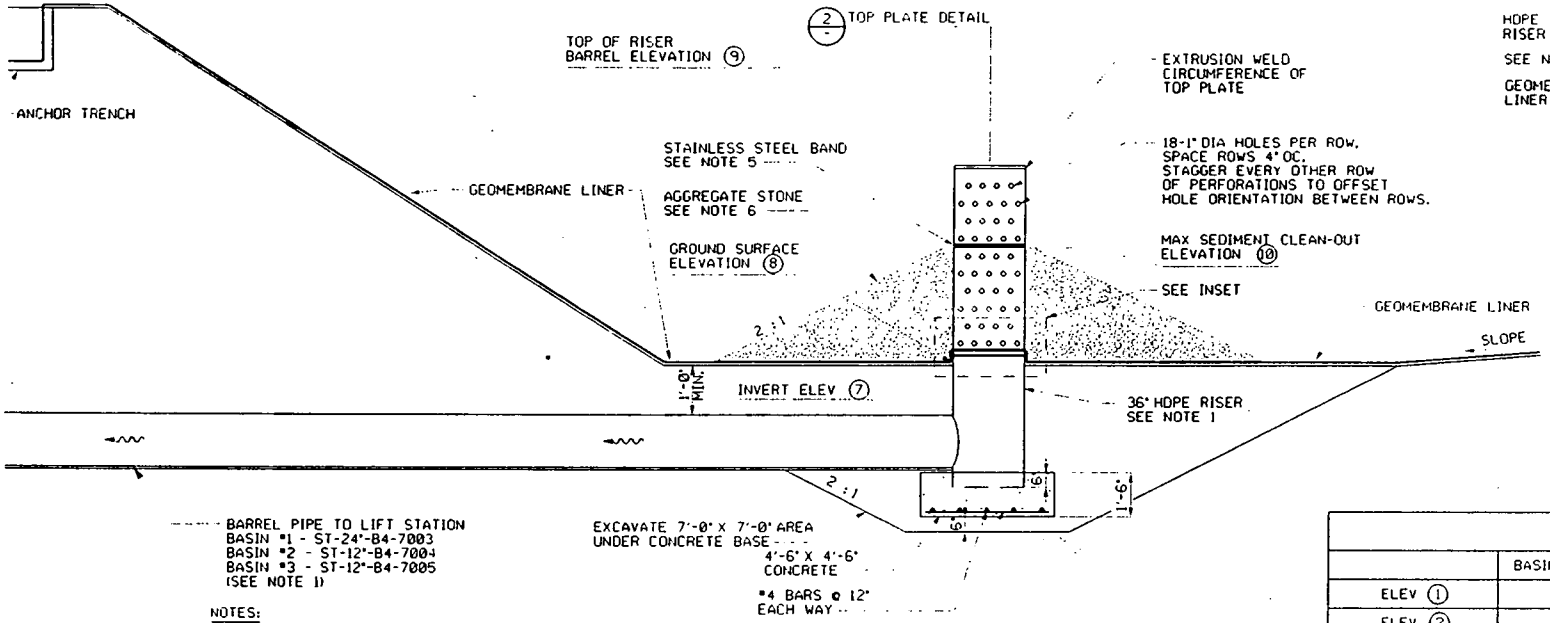
DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
PLANT/BLDG NO.		FLOOR		SCALE 1"=5'	CLASS
SUBMITTED FOR APPROVAL A-E DATE		FERNCO CRU APPROVAL DATE			

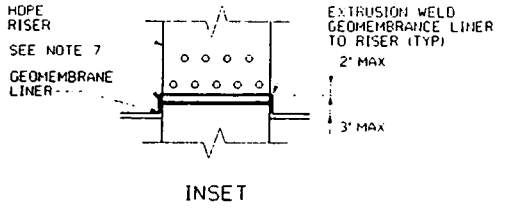
5' 0' 5' 10'
GRAPHIC SCALE: 1"=5'
VERTICAL

5' 0' 5' 10'
GRAPHIC SCALE: 1"=5'
HORIZONTAL

PREPARED UNDER PARSONS PROJECT ORDER NUMBER

DOE PROJECT NO.	ITEM/PROJECT NO.	DRAWING FILE/CODE NO.	SHEET NO.	REV. NO.
	00-90701	SK-G-004548		A





INSET

NOTES:

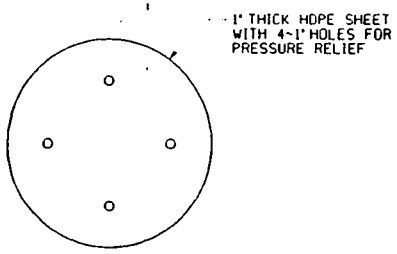
1. FOR ELEVATIONS, SEE TABLE NO. 1 THIS DRAWING.

SIDE VIEW

RISER PIPE DETAIL (1) C0013
NTS

REF
C0009
C0010
C0011

TABLE NO. 1			
	BASIN/LIFT STA 1	BASIN/LIFT STA 2	BASIN/LIFT STA 3
ELEV (1)	541.00	539.00	541.00
ELEV (2)	525.00	523.00	527.50
ELEV (3)	528.00	526.00	530.00
ELEV (4)	537.00	535.00	537.00
ELEV (5)	530.00	528.00	532.00
ELEV (6)	527.00	525.00	529.00
ELEV (7)	528.40	526.70	530.50
ELEV (8)	531.40	528.70	532.50
ELEV (9)	535.20	532.60	536.80
ELEV (10)	532.90	530.30	534.20
FORCE MAIN PIPE TO SWRB	6" CARRIER 10" CONTAINMENT	3" CARRIER 6" CONTAINMENT	3" CARRIER 6" CONTAINMENT



TOP PLATE DETAIL (2) C0013
NTS

94

6621

5.0 SCHEDULE

Site preparation construction activities for the SWUs excavation are scheduled to begin in September 1997. Key dates associated with site preparation are presented in Table 5-1. Excavation of impacted material from the SWUs and subsequent placement in the OSDF are anticipated to begin in the spring/summer of 1998 and continue for approximately two construction seasons. In addition, some further restoration activities may be performed in the future, depending on the final land use selected for the SWUs. This implementation schedule depends on federal funding, regulatory approval, and weather conditions.

TABLE 5-1
KEY DATES

Milestone	Date
Submit PSP for Site Preparation Certification	June 30, 1997
Award Site Preparation Subcontract	August 1, 1997
Begin Mobilization	August 11, 1997
Complete Construction for Site Preparation	June 1, 1998